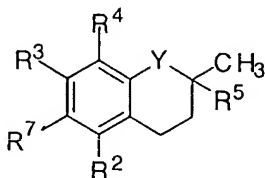


## WHAT IS CLAIMED IS:

1. A method for the treatment of a cell proliferative disease comprising administering to an individual a pharmacologically effective dose of a compound having a structural formula



wherein X is oxygen or nitrogen;

Y is oxygen or NR<sup>6</sup>

- 10 R<sup>1</sup> is -C<sub>1-10</sub>alkylene-COOH, -C<sub>1-4</sub>alkylene-CONH<sub>2</sub>, -C<sub>1-4</sub>alkylene-COO-C<sub>1-4</sub>alkyl, -C<sub>1-4</sub>alkylene-CON(C<sub>1-4</sub>alkylene-COOH)<sub>2</sub>, -C<sub>1-4</sub>alkylene-OH, -C<sub>1-4</sub>alkylene-NH<sub>3</sub>-halo or -C<sub>1-4</sub>alkylene-OSO<sub>2</sub>NH(C<sub>1-4</sub>alkyl), -C<sub>1-4</sub>alkylene-COO-C<sub>1-4</sub>alkyl, -C<sub>1-10</sub>alkylene-CO-SH, -C<sub>1-4</sub>alkylene-CO-S(C<sub>1-4</sub>alkyl), -C<sub>1-4</sub>alkylene-CS-NH<sub>2</sub>, -C<sub>1-4</sub>alkylene-CO-NH<sub>(2-n)</sub>(C<sub>1-4</sub>alkyl)<sub>n</sub>  
 15 wherein n is 2 or 1, -C<sub>1-4</sub>alkylene-SO<sub>2</sub>-O(C<sub>1-4</sub>alkyl), -C<sub>1-4</sub>alkylene-OSO<sub>2</sub>-O(C<sub>1-4</sub>alkyl), -C<sub>1-4</sub>alkylene-OP(O-C<sub>1-4</sub>alkyl)<sub>3</sub>, or -C<sub>1-10</sub>alkylene-CN;

R<sup>2</sup> and R<sup>3</sup> are independently hydrogen or R<sup>4</sup> when R<sup>7</sup> is -XR<sup>1</sup>;

or

$R^2$  and  $R^3$  are hydrogen or  $R^2$  and  $R^3$  are  $R^4$  or  $R^2$  is hydrogen and  $R^3$  is  $R^4$  when  $R^7$  is hydroxyl;

$R^4$  is methyl;

$R^5$  is a  $C_{7-16}$  olefinic group containing 3 to 5 ethylenic bonds;

5  $R^6$  is hydrogen or methyl; and

$R^7$  is hydroxyl or  $-XR^1$ ; or a pharmaceutical composition thereof.

10 2. The method of claim 1, wherein said compound is  $\alpha$ -tocotrienol,  $\gamma$ -tocotrienol or  $\delta$ -tocotrienol.

3. The method of claim 1, wherein said compound is  
15 2,5,7,8-tetramethyl-2R-(4,8,12-trimethyl-3,7,11 E:Z tridecatrien)  
chroman-6-yloxy) acetic acid.

4. The method of claim 1, wherein said compound  
20 exhibits an anti-proliferative effect comprising apoptosis, DNA  
synthesis arrest, cell cycle arrest, or cellular differentiation.

5. The method of claim 1, wherein said compound is administered in a dose of from about 1 mg/kg to about 60 mg/kg.

5 6. The method of claim 5, wherein administration of said composition is selected from the group consisting of oral, topical, liposomal/aerosol, intraocular, intranasal, parenteral, intravenous, intramuscular, or subcutaneous.

10 7. The method of claim 1, wherein said cell proliferative disease is a neoplastic disease, a non-neoplastic disease or a non-neoplastic disorder.

15 8. The method of claim 7, wherein said neoplastic disease is selected from the group consisting of ovarian cancer, cervical cancer, endometrial cancer, bladder cancer, lung cancer, breast cancer, testicular cancer, prostate cancer, gliomas, 20 fibrosarcomas, retinoblastomas, melanomas, soft tissue sarcomas,

ostersarcomas, leukemias, colon cancer, carcinoma of the kidney, pancreatic cancer, basal cell carcinoma, and squamous cell carcinoma.

5           9. The method of claim 7, wherein said non-neoplastic disease is selected from the group consisting of psoriasis, benign proliferative skin diseases, ichthyosis, papilloma, restinosis, scleroderma, hemangioma, leukoplakia, viral diseases, and autoimmune diseases.

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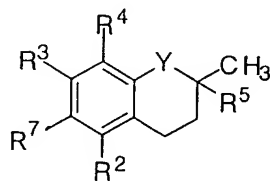
          10. The method of claim 9, wherein said autoimmune diseases are selected from the group consisting of autoimmune thyroiditis, multiple sclerosis, myasthenia gravis, systemic lupus  
15 erythematosus, dermatitis herpetiformis, celiac disease, and rheumatoid arthritis.

          11. The method of claim 5, wherein said non-neoplastic  
20 disorder is a viral disorder or an autoimmune disorder.

12. The method of claim 11, wherein said viral disorder is Human Immunodeficiency Virus.

13. The method of claim 11, wherein said autoimmune disorder is selected from the group consisting of an inflammatory process involved in cardiovascular plaque formation, ultraviolet radiation induced skin damage and disorders involving an immune component.

14. A method of inducing apoptosis of a cell, comprising the step of contacting said cell with a pharmacologically effective dose of the compound having a structural formula



wherein X is oxygen or nitrogen;

Y is oxygen or NR<sup>6</sup>

$R^1$  is  $-C_{1-10}$ alkylene-COOH,  $-C_{1-4}$ alkylene-CONH<sub>2</sub>,  $-C_{1-4}$ alkylene-COO- $C_{1-4}$ alkyl,  $-C_{1-4}$ alkylene-CON( $C_{1-4}$ alkylene-COOH)<sub>2</sub>,  $-C_{1-4}$ alkylene-OH,  $-C_{1-4}$ alkylene-NH<sub>3</sub>-halo or  $-C_{1-4}$ alkylene-OSO<sub>2</sub>NH( $C_{1-4}$ alkyl),  $-C_{1-4}$ alkylene-COO- $C_{1-4}$ alkyl,  $-C_{1-10}$ alkylene-CO-SH,  $-C_{1-4}$ alkylene-CO-S( $C_{1-4}$ alkyl),  $-C_{1-4}$ alkylene-CS-NH<sub>2</sub>,  $-C_{1-4}$ alkylene-CO-NH<sub>(2-n)</sub>( $C_{1-4}$ alkyl)<sub>n</sub> wherein n is 2 or 1,  $-C_{1-4}$ alkylene-SO<sub>2</sub>-O( $C_{1-4}$ alkyl),  $-C_{1-4}$ alkylene-OSO<sub>2</sub>-O( $C_{1-4}$ alkyl),  $-C_{1-4}$ alkylene-OP(O- $C_{1-4}$ alkyl)<sub>3</sub>, or  $-C_{1-10}$ alkylene-CN;

$R^2$  and  $R^3$  are independently hydrogen or  $R^4$  when  $R^7$  is -XR<sup>1</sup>;  
 or

$R^2$  and  $R^3$  are hydrogen or  $R^2$  and  $R^3$  are  $R^4$  or  $R^2$  is hydrogen and  $R^3$  is  $R^4$  when  $R^7$  is hydroxyl;

$R^4$  is methyl;

$R^5$  is a C<sub>7-16</sub> olefinic group containing 3 to 5 ethylenic bonds;

$R^6$  is hydrogen or methyl; and

$R^7$  is hydroxyl or -XR<sup>1</sup>; or a pharmaceutical composition thereof.

15. The method of claim 14, wherein said compound is  $\alpha$ -tocotrienol,  $\gamma$ -tocotrienol or  $\delta$ -tocotrienol.

16. The method of claim 14, wherein said compound is 2,5,7,8-tetramethyl-2R-(4,8,12-trimethyl-3,7,11 E:Z tridecatrien) chroman-6-yloxy) acetic acid.

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17. The method of claim 14, wherein said method is useful in the treatment of a cell proliferative disease.